Qualification Accredited

OCR
Oxford Cambridge and RSA

GCSE (9-1)

Examiners' report

TWENTY FIRST CENTURY SCIENCE COMBINED SCIENCE B

J[redacted]60
For first teaching in 2016

J260/01 Summer 2018 series

Version 1

Contents

Introduction 4
Paper J260/01 series overview....5
Question 1 6
Question 2 (a) 7
Question 2 (b) 8
Question 2 (c) (i) 10
Question 2 (c) (ii) 10
Question 3 (a) (i) 11
Question 3 (a) (ii) 11
Question 3 (a) (iii) 12
Question 3 (b) (i) 12
Question 3 (b) (ii) 12
Question 3 (b) (iii) 13
Question 4 (a) 13
Question 4 (b) (i) 14
Question 4 (b) (ii) 14
Question 4 (c) (i) 15
Question 4 (c) (ii) 15
Question 4 (c) (iii)....16
Question 4 (d) 16
Question 4 (e) 16
Question 4 (f) 17
Question 5 (a) (i) 18
Question 5 (a) (ii) 18
Question 5 (b) (i) 19
Question 5 (b) (ii) 19
Question 5 (b) (iii) 19
Question 5 (c) (i) 20
Question 5 (c) (ii) 21
Question 6 (a) (i) 21
Question 6 (a) (ii) 21
Question 6 (b) (i) 22
Question 6 (b) (ii) 23
Question 6 (b) (iii) 23

Question 6 (b) (iv) 23
Question 7 (a) (i) 24
Question 7 (a) (ii) 25
Question 7 (b) (i) 25
Question 7 (b) (ii) 25
Question 7 (b) (iii) 26
Question 7 (b) (iv) 27
Question 7 (c) 27
Question 8 (a) 28
Question 8 (b) 29
Question 9 (a) 31
Question 9 (b) 32
Question 10 (a) (i) 33
Question 10 (a) (ii) 33
Question 10 (b) (i) 34
Question 10 (b) (ii) 34
Question 10 (c) 35

Introduction

Our examiners' reports are produced to offer constructive feedback on candidates' performance in the examinations. They provide useful guidance for future candidates. The reports will include a general commentary on candidates' performance, identify technical aspects examined in the questions and highlight good performance and where performance could be improved. The reports will also explain aspects which caused difficulty and why the difficulties arose, whether through a lack of knowledge, poor examination technique, or any other identifiable and explainable reason.

Where overall performance on a question/question part was considered good, with no particular areas to highlight, these questions have not been included in the report. A full copy of the examination paper can be downloaded from OCR.

Paper J260/01 series overview

J260/01 is the Biology Foundation paper as part of the GCSE Combined Science B Suite. The examination covered topics B1 to B6 plus ideas about science and practical skills. To do well on this paper, candidates need to be comfortable applying their knowledge and understanding of scientific principles. They must also be familiar with a range of practical equipment and techniques.

Most candidates made a good attempt at answering all the questions and limited their responses to the available spaces. The paper was challenging and discriminated well between candidates. There was no evidence that candidates ran out of time on this paper.

Candidate performance overview

Candidates who did well on this paper generally did the following:

- Understood the term standard form e.g. 3a(iii).
- Performed calculations to the correct rubric e.g. percentage to one decimal place 6b(iii) and probability to one significant figure e.g.10b(i).
- Produced clear and concise responses for the Level of Response question 8b.
- Carried out a genetic cross and explained it e.g. 9b.
- Applied knowledge and practical skills of an investigation on the effect of different sugars on the rate of anaerobic respiration in yeast in Q4.

Candidates who did less well on this paper generally did the following:

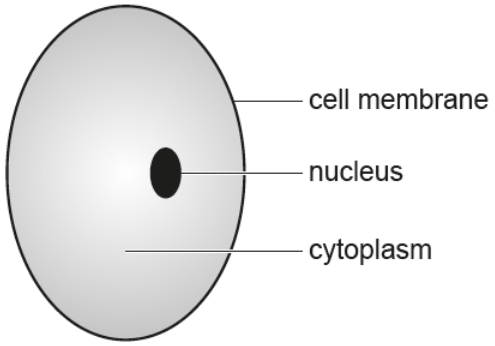
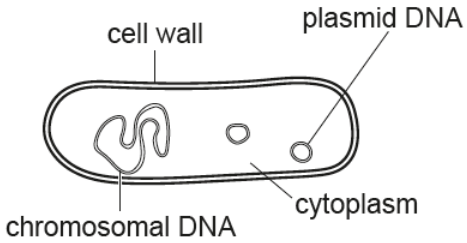
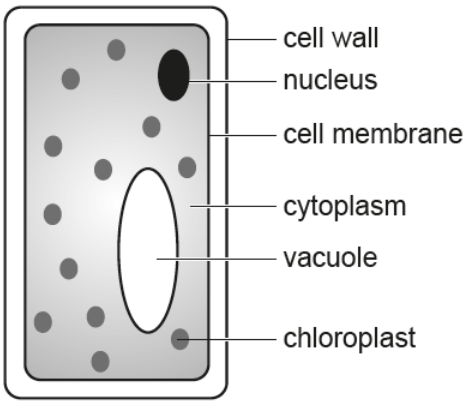
- Found it difficult to apply what they had learnt in practical investigations to unfamiliar situations e.g. Q7.
- Produced responses that lacked depth and sometimes simply repeating the information provided. e.g. 5a(ii), 7b(iii), 7b(iv), 8b.
- Did not provide data as asked for in the question e.g. 10a(ii).
- Could not identify the types of cell division and did not have knowledge of the differences between mitosis and meiosis in Q9(b).

Question 1

1 The diagrams in the table show different types of cells.

Identify the type of cell shown in each diagram.

Tick **one** box in each row.

Diagram of cell	Type of cell		
	Plant	Animal	Bacterial
			
			
			

[3]

In this question candidates were required to know the differences between plant, animal and bacterial cells to be able to identify them. More than half of the candidates gained full marks. Some candidates incorrectly identified one of the cells, usually the bacterial cell. This led to a second error and only one mark was gained.

Question 2 (a)

2 Hormones control many processes in the human body.

(a) Complete the sentences about hormones using words from the list.

Each word may be used once, more than once or not at all.

blood **glands** **nerves** **organs**

receptors **response** **stimuli**

Hormones enable the body to respond to internal or external ..... .

Hormones are secreted by ..... .

Hormones are transported by the ..... .

Hormones attach to ..... on effectors. This causes

a ..... .

[5]

This question required knowledge about hormones. The answer "response" was the most common correct answer even if this word had already been used once before. Glands and blood were the next frequent correct answers. Many candidates got this mixed up with organs and nerves respectively.

Question 2 (b)

(b) The menstrual cycle is controlled by hormones.

The graph in **Fig. 2.1** shows changes in the levels of these hormones during the menstrua cycle when an egg is not fertilised.

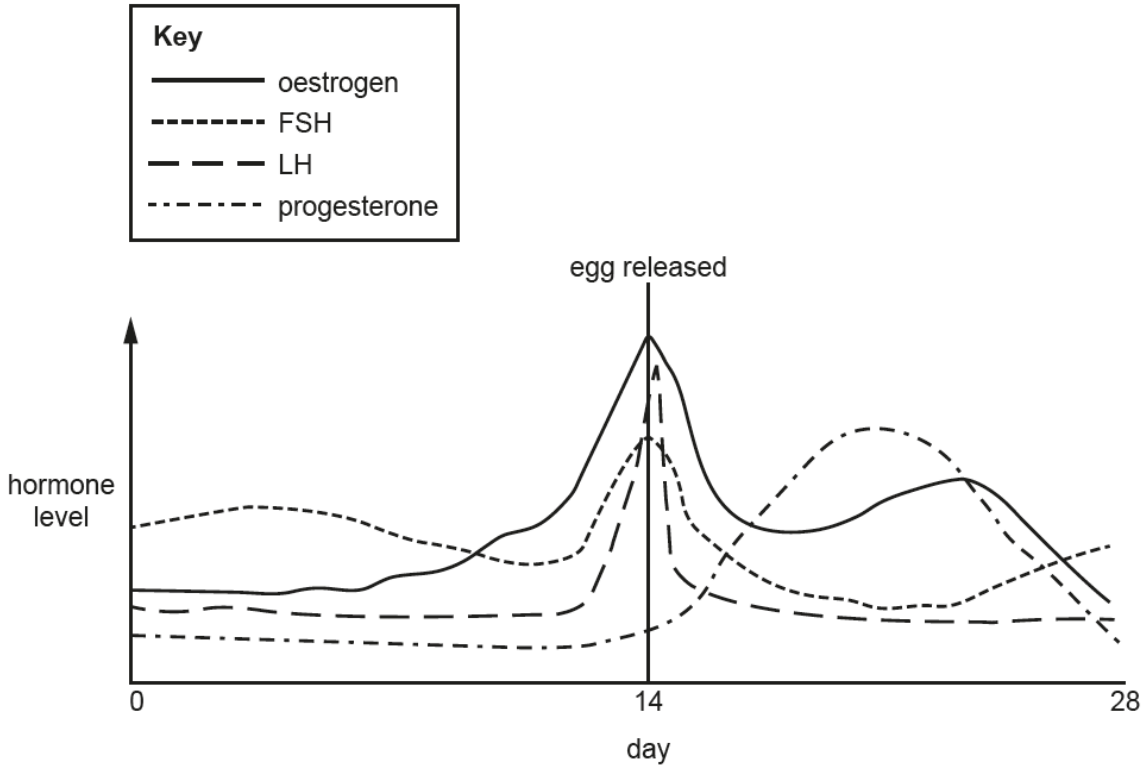


Fig. 2.1

Look at the graph in **Fig. 2.1**.

Describe how the hormone levels change after an egg has been released.

.....

.....

.....

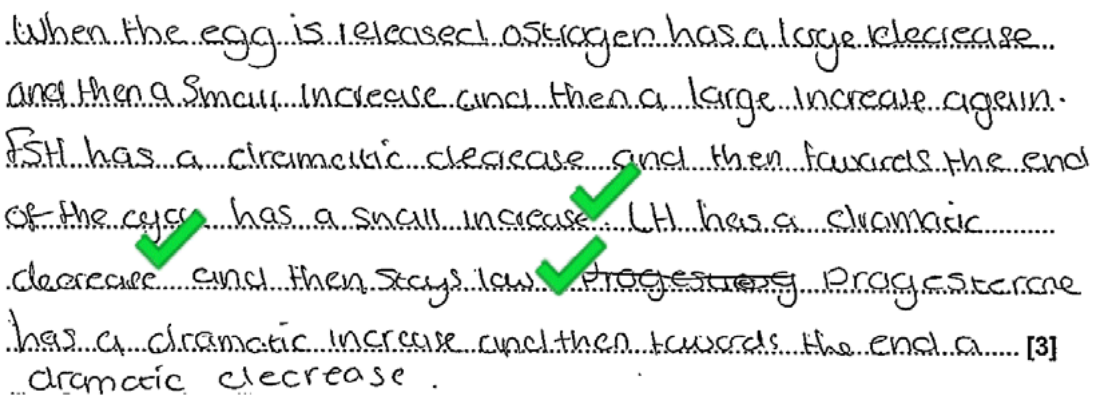
.....

.....

..... **[3]**

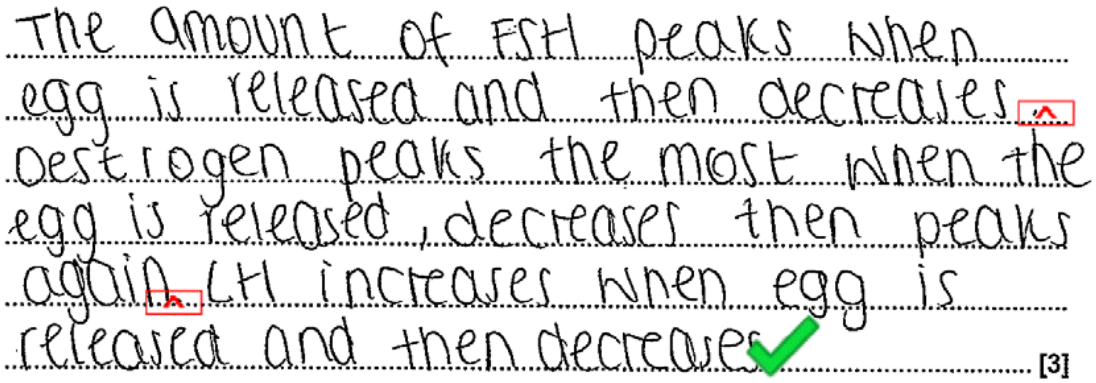
Candidates that performed well on this question referred to each hormone in turn and described the pattern after the egg had been released. Many candidates described the graph from the beginning and only gave part of the pattern for each hormone. To improve their responses candidates should describe the pattern of each hormone in full and use words such as increase, decrease and constant instead of fluctuating.

Exemplar 1



This candidate gained full marks. The first sentence includes oestrogen decreases but the rest of the pattern is about the increases and no mention of the decrease at the end, so cannot gain marking point 2. The FSH description of a decrease and then an increase is correct for marking point 3 of the mark scheme. The LH pattern of a decrease and then remains constant is correct for marking point 4. Throughout the answer this candidate has described a decrease in oestrogen, FSH and LH and therefore also gains marking point 1, giving a total of 3 marks.

Exemplar 2



This candidate describes each hormone in turn including a peak of FSH, oestrogen and LH at egg release and then a subsequent decrease. The increase is not credit worthy as the question asks for the pattern **after** egg release. The decrease of these three hormones after egg release gains marking point 1. No further description of each hormone after the decrease is given and therefore no further marks are gained.

Question 2 (c) (i)

(c) (i) Contraceptive pills contain hormones that can prevent pregnancy.

Which statement gives the best explanation of how the hormones in a contraceptive pill prevent pregnancy?

Tick (✓) **one** box.

- The hormones speed up the menstrual cycle. ☐
- The hormones slow down the menstrual cycle. ☐
- The hormones prevent ovulation. ☐
- The hormones kill sperm. ☐

[1]

The most common incorrect answers were that the hormones kill sperm and the hormones slow down the menstrual cycle.

Question 2 (c) (ii)

(ii) Give **one disadvantage** of relying only on a hormone contraceptive pill to prevent pregnancy.

.....

..... **[1]**

This question was asking why only using a hormone contraceptive was a disadvantage and this was misinterpreted by many candidates who just gave a disadvantage of using a hormone contraceptive. The most common incorrect answers were describing its lack of effectiveness even though the pill is considered to be one of the most reliable forms of contraceptive. Most correct answers included ideas about women forgetting to take the pill rather than reducing the spread of STIs as expected on the mark scheme.

Question 3 (a) (i)

3 This question is about the genome.

(a) (i) Which **two** statements about the genome are correct?

Tick (✓) **two** boxes.

- The genome is the entire genetic material of an organism. ☐
- Each organism's genome is identical. ☐
- In most organisms, the genome is packaged into chromosomes. ☐
- Only some organisms have a genome. ☐
- The genome of animal cells is stored in the cytoplasm. ☐

[2]

Most candidates ticked two boxes as asked to do in the question. Many correctly knew that the genome is the entire genetic material of an organism which gained one mark. The second marking point was more difficult to credit and there was no specific incorrect answer ticked more than any other.

Question 3 (a) (ii)

(ii) A student makes some notes about genomes.

1. The genome is made from DNA.
2. Genes are sections of DNA.
3. DNA is wound into a triple helix.
4. DNA is a polymer.
5. DNA is made from amino acids.

The teacher spots some mistakes.

Write down the numbers of the **two** sentences that contain mistakes.

Sentences ..... and ..... **[2]**

Many candidates knew that DNA is not made from amino acids and therefore correctly picked number 5 from the list. The second marking point was more difficult to credit with a range of incorrect answers if number 3 was not identified.

Question 3 (a) (iii)

(iii) The sequence of bases in a whole human genome can be worked out.

It cost £1 000 000 000 to sequence a human genome in 2003. It can now be done for £1000.

How many times more expensive was it in 2003 than it is now to sequence a human genome?

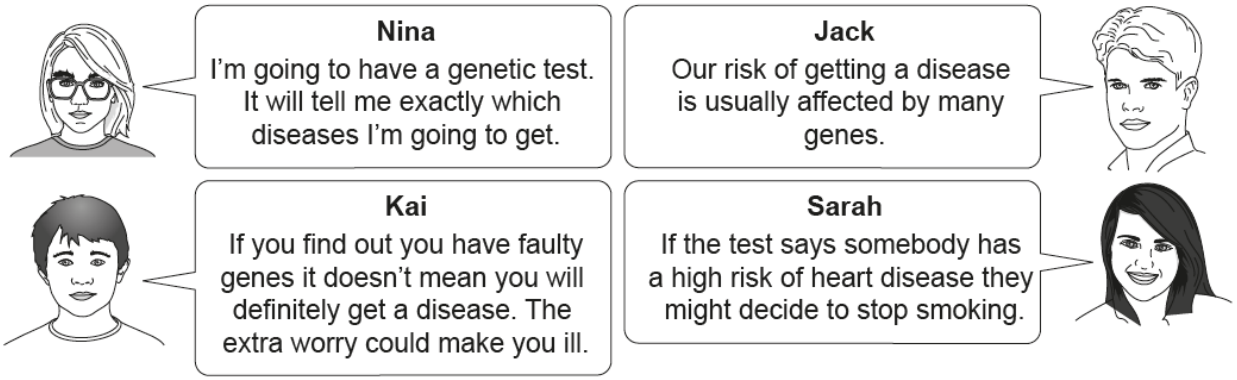
Put a (ring) around the correct answer in standard form.

10^4 10^5 10^6 10^7

[1]

Question 3 (b) (i)

(b) Four students talk about genetic testing.



(i) Which student suggests that only a few diseases are caused by single genes?

Tick (✓) **one** box.

- Nina ☐
- Jack ☐
- Kai ☐
- Sarah ☐

[1]

Question 3 (b) (ii)

(ii) Which student suggests a possible extra health risk caused by having a genetic test?

Tick (✓) **one** box.

- Nina ☐
- Jack ☐
- Kai ☐
- Sarah ☐

[1]

Question 3 (b) (iii)

(iii) Which student has forgotten that the genome and the environment both affect our features?

Tick (✓) **one** box.

Nina ☐

Jack ☐

Kai ☐

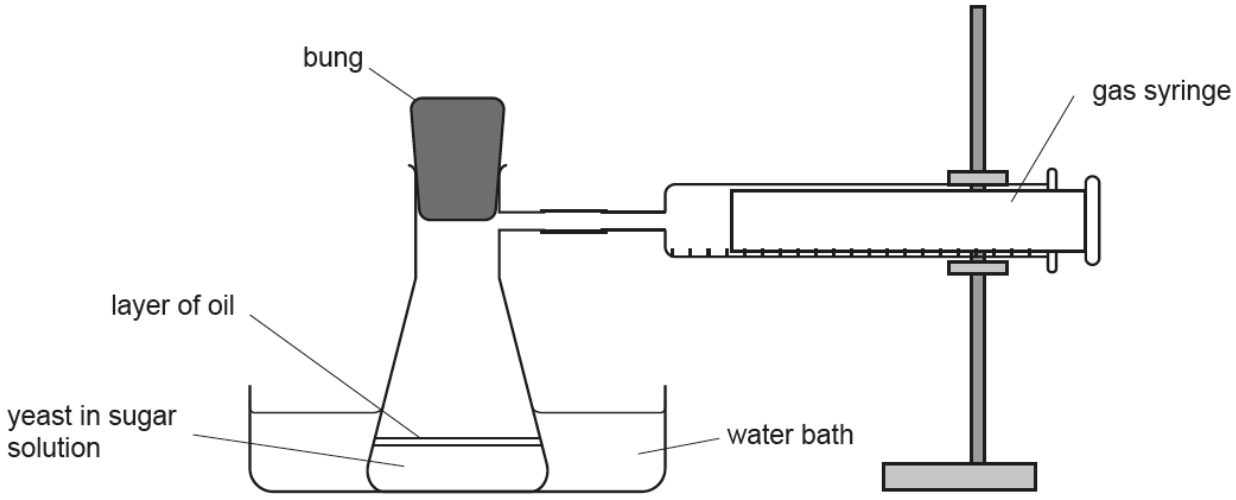
Sarah ☐

[1]

Question 4 (a)

4 A student wants to investigate the effect of different sugars on the rate of anaerobic cellular respiration in yeast.

They use the apparatus shown in the diagram for their investigation.



(a) Which piece of equipment should the student use to measure the volume of sugar solution accurately?

Put a (ring) around the correct answer.

balance **conical flask** **measuring cylinder** **thermometer**

[1]

Question 4 (b) (i)

(b) A gas is produced by the yeast during anaerobic cellular respiration.

(i) What is the name of the gas produced by the yeast?

Tick (✓) **one** box.

- Carbon dioxide ☐
- Methane ☐
- Nitrogen ☐
- Oxygen ☐

[1]

Half the candidates knew that carbon dioxide is produced by yeast during anaerobic respiration. Most of the incorrect answers were methane followed by oxygen.

Question 4 (b) (ii)

(ii) The gas is collected in the gas syringe.

Explain why using a gas syringe is a better technique to use than counting the bubbles of gas produced.

.....

..... **[2]**

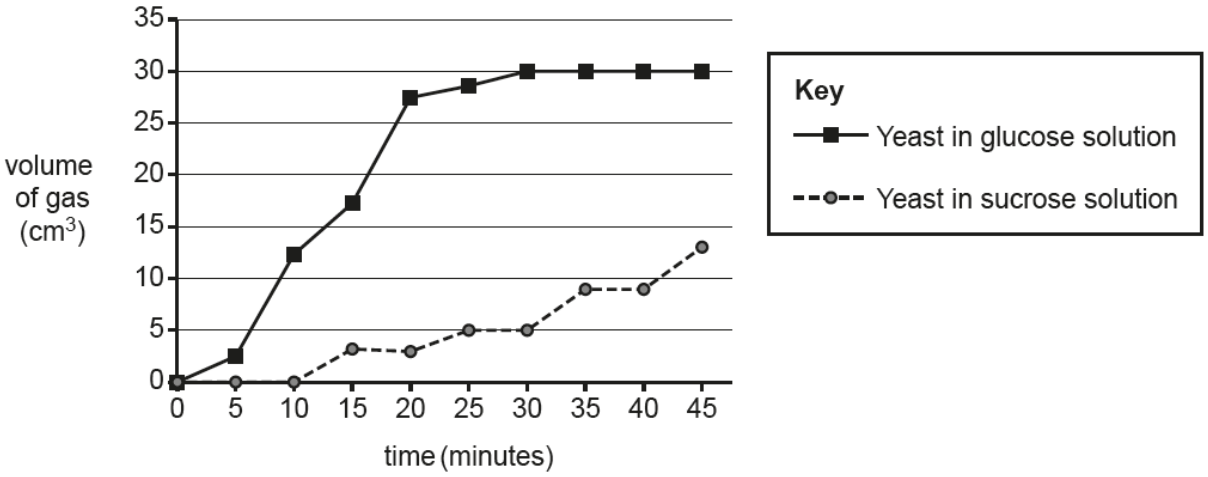
Many candidates only gave one reason on the lines provided. The second marking point referring to accuracy of the syringe was credited more often than the first marking point. Some candidates thought that the bubbles would pop and so couldn't be counted at all rather than giving the idea that they would be too quick to count.

Question 4 (c) (i)

(c) The student does two experiments in their investigation:

- one using yeast in a sugar solution containing glucose
- one using yeast in a sugar solution containing sucrose.

The student plots a graph of the results.



(i) Which conclusion could be made from the graph?

Tick (✓) **one** box.

Yeast respires fastest using glucose. ☐

Yeast respires at a constant rate using sucrose. ☐

Yeast cannot use sucrose in respiration. ☐

Yeast respires at the same rate using glucose and sucrose. ☐

[1]

Question 4 (c) (ii)

(ii) How much gas had been collected after 30 minutes from the yeast in glucose solution?

Volume of gas = ... cm^3 **[1]**

Question 4 (c) (iii)

(iii) The student makes some suggestions to explain the pattern of results for yeast in glucose solution after 30 minutes.

Which statements give the **two** best explanations?

Tick (✓) **two** boxes.

- The yeast have used up all the glucose. ☐
- The layer of oil has stopped any more gas escaping. ☐
- The yeast have run out of oxygen. ☐
- No more gas is being made by anaerobic respiration. ☐
- The yeast have switched to aerobic respiration. ☐

[2]

The majority of candidates ticked two boxes as asked for in the question gaining credit for at least one box.

Question 4 (d)

(d) The student wanted to prove that it was the yeast producing the gas.

Which suggestion would allow the student to prove this?

Tick (✓) **one** box.

- Add more sugar to the solution. ☐
- Boil the yeast to kill it before adding the sugar solution. ☐
- Repeat the experiment at different temperatures. ☐
- Use a different type of yeast. ☐

[1]

This question was challenging and required candidates to understand that once the yeast were killed they would not be able to respire and produce gas. Many candidates thought repeating the experiment at different temperatures would prove it was the yeast producing the gas.

Question 4 (e)

(e) Anaerobic respiration also happens in animal cells.

Put a (ring) around the correct option to complete each sentence to describe anaerobic respiration in **animal** cells.

The reactant used is **glucose / carbon dioxide / lactic acid**.

The product is **glucose / carbon dioxide / lactic acid**.

[2]

This question required the candidate to draw on knowledge about anaerobic respiration in animal cells rather than yeast as in the previous parts of the question. Some candidates got the answers the wrong way around, while others gained credit for glucose and then gave carbon dioxide as the product.

Question 4 (f)

(f) Energy from cellular respiration can be used to transport molecules across cell membranes.

What is the name of this process?

Tick (✓) **one** box.

- Active transport ☐
- Diffusion ☐
- Osmosis ☐
- Transpiration ☐

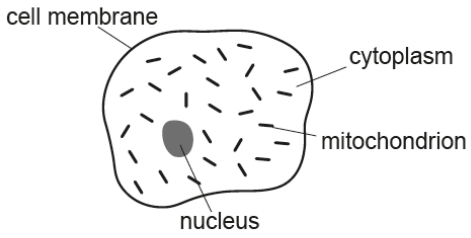
[1]

Candidates had to recognise the process that requires energy to transport molecules across cell membranes. Nearly half picked out active transport. Diffusion and transpiration were the most common incorrect boxes ticked.

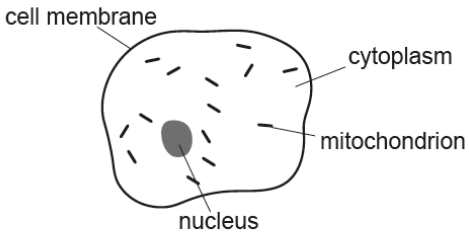
Question 5 (a) (i)

5 The heart and blood transport substances to and from cells in the human body.

The diagrams show two human cells.



Cell A



Cell B

Cell **A** has more mitochondria than cell **B**.

Cell **A** will need to take in more of some substances than cell **B**.

(a) (i) Which two substances will cell **A** need to **take in** more of?

Put (rings) around the **two** correct answers.

carbon dioxide **dissolved food molecules** **oxygen** **urea** **water**

[2]

In this question candidates had to recognise that cell A with more mitochondria would need more oxygen and dissolved food molecules than cell B. Oxygen was the most common correct answer credited with both water and carbon dioxide being common incorrect answers.

Question 5 (a) (ii)

(ii) Explain why cell **A** needs more of these substances.

.....

.....

..... **[2]**

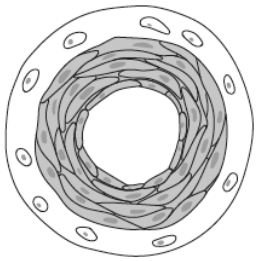
This question required candidates to make the link between more mitochondria and the use of the substances in Q5a(i) to aerobic respiration in the mitochondria or the need for more energy in the cell. Many responses repeated the idea of many mitochondria and mentioned that this was linked to energy in some way. A common error was that the mitochondria need the energy.

Question 5 (b) (i)

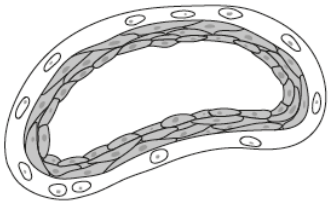
(b) Blood travels in blood vessels.

Kareem looks at two blood vessels using a light microscope.

The diagrams show what he sees.



X



Y

(i) Kareem thinks vessel **X** is an artery and vessel **Y** is a vein.

Explain why he is correct.

.....

..... **[1]**

Candidates attempted to describe the difference between X and Y and correct answers were commonly about the thickness of the wall. Some candidates found it difficult to be clear about what was thinner or thicker or did not use comparative language e.g. vessel X has thick walls. Many candidates described the shape of the vessels as round and squashed which was not credited.

Question 5 (b) (ii)

(ii) What other structure **not** shown in the diagrams would be found in a vein?

..... **[1]**

This question required the knowledge that veins contained valves and was challenging for many candidates, some choosing to leave it blank. Common incorrect answers were blood, blood cells and capillaries.

Question 5 (b) (iii)

(iii) Kareem uses a ×10 eyepiece lens and a ×40 objective lens to look at the slides using the microscope.

What is the total magnification of these two lenses?

Total magnification = ×..... **[1]**

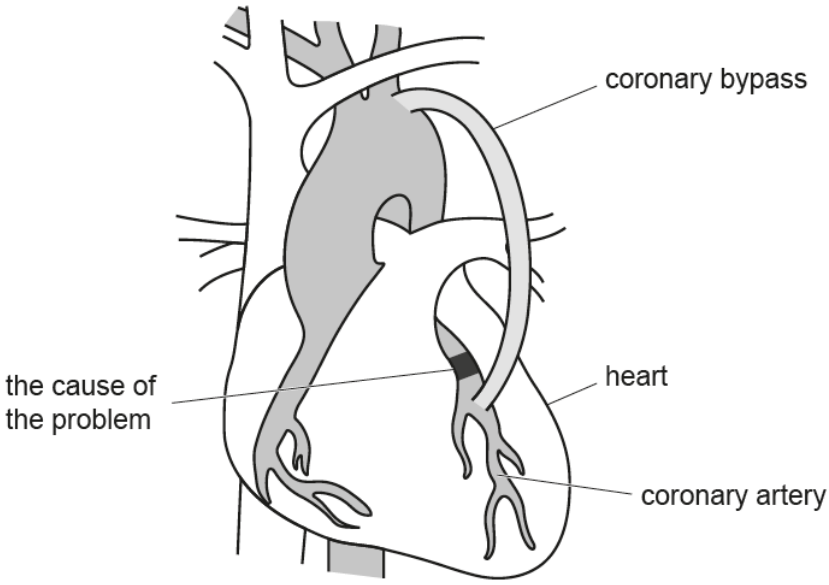
To calculate magnification candidates had to apply their knowledge of the use of the microscope. Many candidates had this skill. The common error was adding the 10 and 40 together to get 50.

Question 5 (c) (i)

(c) A doctor finds a problem with Kareem's heart.

A bypass operation would help Kareem's heart to work normally again.

The doctor uses a diagram to show Kareem how the operation would help him.



(i) Use the diagram to explain the cause of the problem and how the bypass operation would help him.

.....

.....

.....

..... **[2]**

Many candidates could correctly recognise that the problem was a blockage in the coronary artery. The second marking point was more challenging as candidates found it difficult to articulate the idea of an alternative route or suggested that the clot was removed by the bypass. Some candidates confused heart and lung function by referring to breathing problems.

Question 5 (c) (ii)

(ii) Kareem is at risk of having a heart attack.

If Kareem changes his lifestyle he could lower his risk of heart attack.

Explain why it may be better for Kareem to change his lifestyle rather than have a bypass operation.

.....

.....

.....

..... **[2]**

This question was challenging as many responses focussed on what the lifestyle change would be such as eating less sugar or doing more exercise to be healthier. Very few candidates identified the risk between the two options. Those candidates that did, could not articulate what the risk would be.

Question 6 (a) (i)

6 Approximately one quarter of all the trees in Great Britain are ash trees.

In 2012 scientists found trees with a disease called ash dieback.

(a) (i) Ash dieback is a communicable disease.

Put a (ring) around the type of pathogen that causes ash dieback.

bacterium **fungus** **protist** **virus**

[1]

Question 6 (a) (ii)

(ii) How is ash dieback spread from one tree to another?

Tick (✓) **two** boxes.

- Carried by insects ☐
- Contaminated soil ☐
- Contaminated water ☐
- Movement of contaminated plant material ☐
- Wind-blown spores ☐

[2]

Question 6 (b) (i)

(b) Scientists have collected data on the spread of ash dieback since 2012.

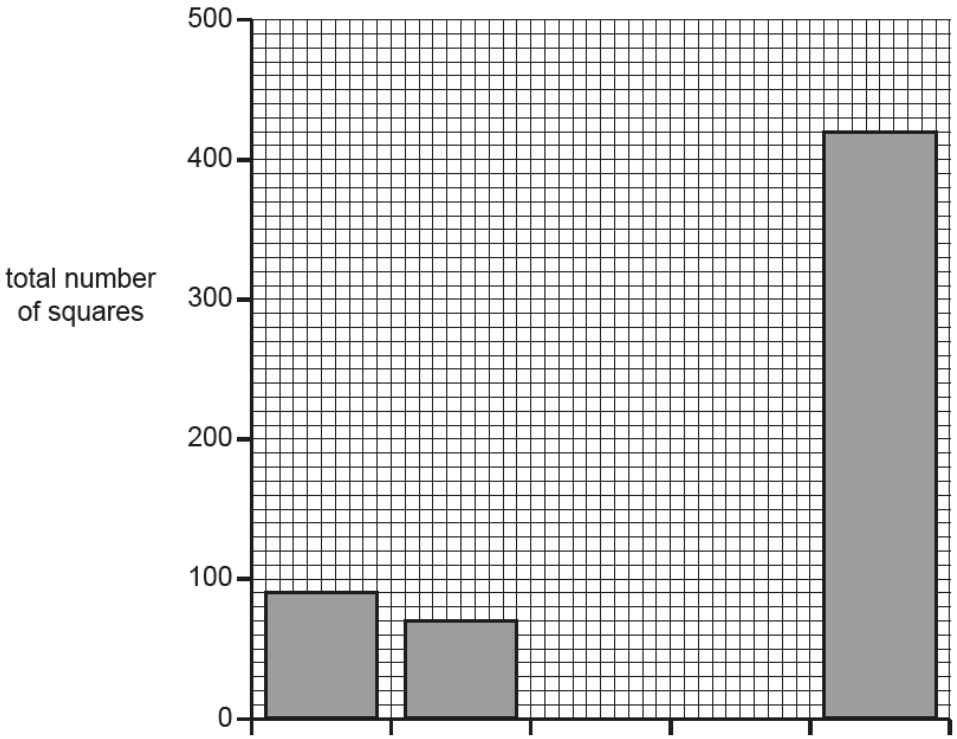
The scientists divided Great Britain into squares.

Each year they recorded the number of squares in which ash dieback was identified for the first time. The results are shown in **Table 6.1**.

Year	Total number of squares in which ash dieback identified for first time in Great Britain
2012	90
2013	70
2014	200
2015	380
2016	420

Table 6.1

(i) Complete the bar chart using the data in **Table 6.1 and** label the x-axis.



.....

[2]

Candidates were asked to plot a graph of data for the total number of squares in which ash dieback was identified in different years, candidates performed well. Many responses gained both marks for this question showing that candidates could correctly draw bars from the data and label the x axis. Marks were lost when the bars were not at the correct height or the axis was incomplete with either the numbers or the heading was missing.

Question 6 (b) (ii)

(ii) Which year does **not** fit the trend in the data?

Put a (ring) around the correct answer.

2012 **2013** **2014** **2015** **2016**

[1]

Question 6 (b) (iii)

Table 6.2 shows data for the individual countries within Great Britain.

Country	Number of squares in which ash dieback identified for first time						Total number of squares in country
	2012	2013	2014	2015	2016	Total	
Scotland	7	5	33	125	10	180	1100
England	83	63	162	224	314	846	1470
Wales	0	2	5	31	96	134	265

Table 6.2

(iii) Calculate the percentage of all squares in **Wales** with ash dieback.

Give your answer to **1** decimal place.

Percentage = ...% **[2]**

Higher ability candidates were able to correctly select the figures from the table and calculate percentage of squares in Wales with ash dieback to 1 decimal place. Incorrect responses usually had 265 from the table and then a variety of other numbers and calculations that showed a lack of understanding of the mathematics involved to calculate the percentage.

Question 6 (b) (iv)

(iv) Use the data in **Table 6.2** and your own knowledge to explain why scientists are concerned about ash dieback arriving in Great Britain.

.....

.....

.....

..... **[2]**

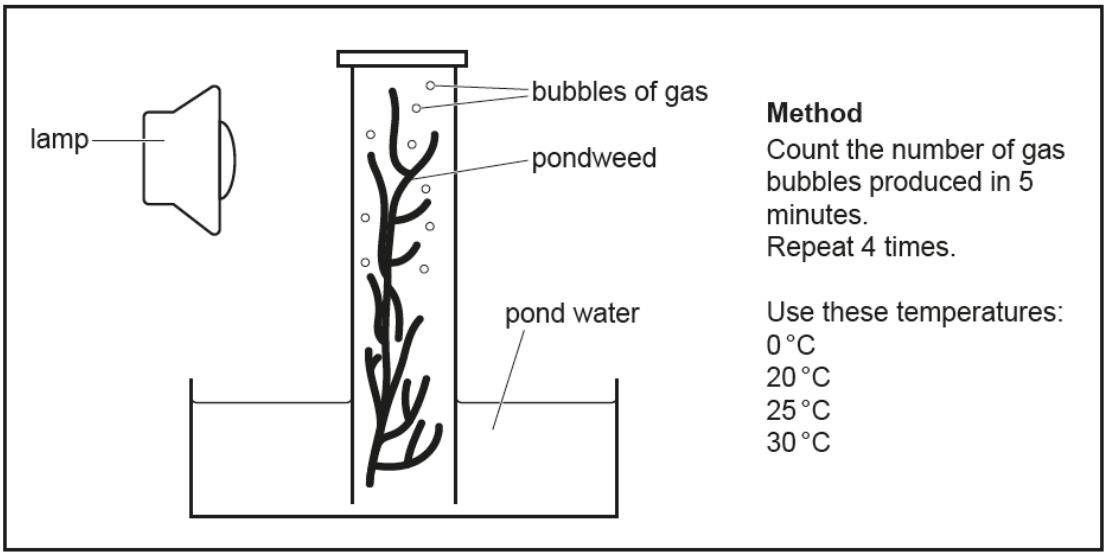
More than half the candidates were able to analyse the information in the table and suggest that the fungus was spreading. The first marking point that ash dieback is fatal to ash trees was not well known. Some candidates thought other plants or even humans might catch the disease.

Question 7 (a) (i)

7 Amaya is planning an investigation.

She wants to find out how temperature affects the rate of photosynthesis.

The information below is taken from her lab notebook.



(a) (i) Amaya plans to investigate four different temperatures.

Room temperature is 20 °C.

Describe how Amaya can set up her experiment at the other temperatures.

.....

.....

..... **[2]**

Many candidates were able to recognise this investigation on the factors that investigate the rate of photosynthesis. The diagram of the equipment with the lamp led to many incorrect answers moving the lamp closer and further away to change the temperature with the heat from the lamp. Many candidates suggested moving all the experiment into different rooms at different temperatures. Future investigations in the classroom could explore changing temperature in addition to investigations changing light intensity.

Question 7 (a) (ii)

(ii) Which factors should Amaya keep the same to make sure she collects valid data?

Tick (✓) **two** boxes.

- The brightness of the lamp. ☐
- The level of carbon dioxide in the pond water. ☐
- The level of oxygen in the pond water. ☐
- The size of the bubbles. ☐
- The rate of photosynthesis. ☐

[2]

The brightness of the lamp was a well known response on what to keep the same. The second marking point was more difficult and was sometimes confused with keeping the level of oxygen the same.

Question 7 (b) (i)

(b) **Table 7.1** shows Amaya's results.

Temperature (°C)	Number of bubbles counted in 5 minutes			
	Repeat 1	Repeat 2	Repeat 3	Repeat 4
0	2	2	0	4
20	16	12	17	13
25	24	18	25	19
30	33	25	34	26

Table 7.1

(i) What is the range for the results at 30 °C?

Range = ... **[1]**

Half of the candidates were able to correctly calculate the range from the data. Some candidates added the repeats together giving an answer of 118 and some candidates went on to calculate a mean of 30, misunderstanding what the term 'range' meant.

Question 7 (b) (ii)

(ii) Calculate the mean number of bubbles at 30 °C.

Mean number of bubbles = ... **[1]**

Question 7 (b) (iii)

(iii) Describe the pattern of results shown in **Table 7.1** and use ideas about enzymes to explain the pattern of results.

.....

.....

.....

.....

.....

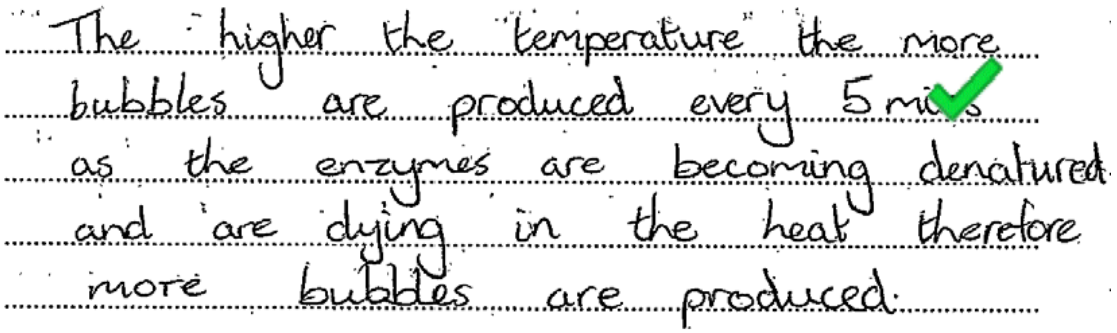
.....

.....

..... **[4]**

Candidates found this question very challenging. Many candidates were able to access the first marking point by stating the correlation between the temperature and number of bubbles but were then unable to explain this and make the link to oxygen bubbles and photosynthesis. Common errors were describing the pattern in the repeats for each temperature and stating that the enzymes are denatured.

Exemplar 3



This candidate gained 1 mark for being able to describe the increase in bubbles when the temperature is increased. They then incorrectly suggested that this is because the enzymes are denatured. Candidates are often keen to mention the word denature when temperature is increased.

Question 7 (b) (iv)

(iv) Amaya repeats her investigation at a temperature of 50 °C.

She finds a lower mean number of bubbles.

Explain why.

.....

.....

.....

..... **[2]**

Very few candidates were able to link the increase in temperature to enzymes and therefore many candidates did not gain any marks for saying it was too hot or that it may boil. The most common correct answer was that the enzymes denature.

Question 7 (c)

(c) A plant makes glucose when it photosynthesises. The glucose is then turned into starch for storage.

A student wants to show that there is both glucose and starch in a leaf from a plant.

Draw a line to link each **substance** to the **reagent** the student should use to test for it.

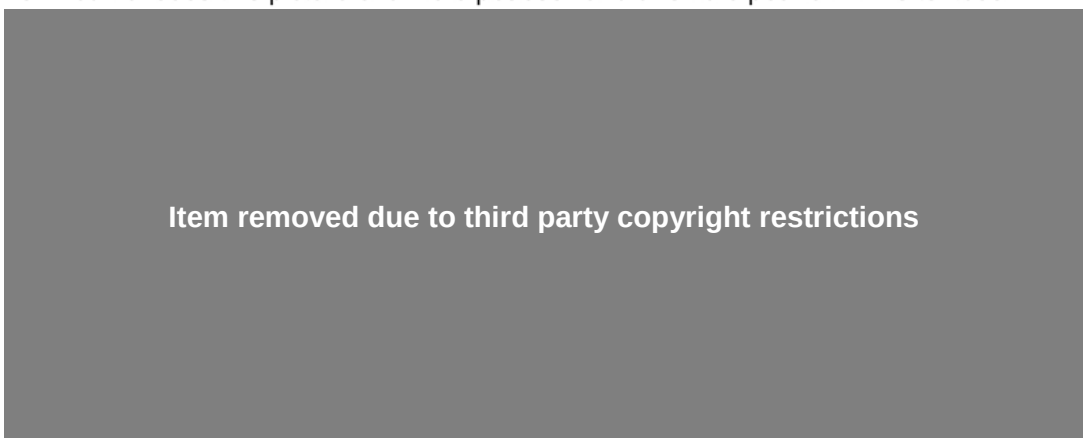
Substance	Reagent
	Benedict's solution
Glucose	Biuret solution
Starch	Ethanol
	Iodine solution

[2]

Many candidates incorrectly drew two lines from each substance to ensure that all the reagents were used. The most common correct answer was starch linked to the iodine solution.

Question 8 (a)

8 Jamal sees this picture of a male peacock and a female peahen in his textbook.



Peahens have plain grey feathers, which makes it hard for predators to see them.

The male peacock has brightly coloured feathers and a large tail that it uses to attract peahens so they can mate.

(a) Suggest **two disadvantages** of the male peacock's brightly coloured feathers.

1 .....

2 .....

[2]

Many candidates could apply their knowledge that brightly coloured feathers would be more easily seen by predators. Candidates usually gave a disadvantage of the large tail such as slowing them down, even though this had not been asked for by the question.

Question 8 (b)

(b)* Jamal's textbook says that the male's bright feathers and large tail evolved by natural selection, even though there are some disadvantages to having them.

Explain how the male peacock's features evolved by natural selection and why they are still present despite these disadvantages.

.....

.....

.....

.....

.....

.....

.....

..... **[6]**

This was the six-mark Level of Response question. It required knowledge and understanding of natural selection and the application of this knowledge to explain why the peacock's features were still present. Many candidates secured marks at Level 1 for explaining the advantage of attraction and mating. A large number of candidates confused natural selection with selective breeding and this limited their response. Responses that were developed to include ideas on the survival of the peacocks and passing on the characteristics were credited Level 2. There were few responses that could fully explain natural selection at the genetic level for Level 3.

Exemplar 4

the male peacock's features have evolved because every animal chainges over time so the peacock's bright feathers and large tail has come over time to attract the female Peahen's, there long tails could also be used for fighting, and by having the bright feathes will attract the Peahens and help them mate.

This candidate has correctly explained why the bright feathers are still present. They refer to the attraction of female peahens for mating. This information is relevant and has logical structure. There is no mention of passing on features or the genetics of evolution, so is limited to Level 1, 2 marks.

Exemplar 5

a ~~peacocks~~ peacocks feathers may have evolved by natural selection as in order to attract a mate, they will need to stand out, hense the brightly coloured feathers, natural selection would have allowed those with brightly coloured feathers to breed whilst those with duller feathers ~~died~~ slowly died off, decreasing the chance of dull coloured feathers of males being born, they are still present despite the disadvantages as they are essential for the breeding of peacocks [6]
as it increases the chance of peacocks finding a mate, therefore reducing the risk of extinction.

L2

This candidate explains the advantage of bright feathers for attracting peahens and being more likely to breed and pass on these traits, while the peacocks with dull coloured feathers would not. The answer does not make any reference to genetics so is limited to Level 2, 4 marks.

Exemplar 6

As females peahen's ~~was~~ were attracted to the Peacock who had the feature of brightly coloured tail, the was a greater chance that they would mate. This furthemore created offspring that also carry the gene for bright colours and large tail. These offspring would then pass on this gene to their own offspring.

Eventually the numbers of peacocks with brightly coloured feathers and large tail, out numbered those that did not. Even dispite the disadvantages the female attraction and possibly the dominant allele ~~explained that~~ explains why these features are still present today. [6]

L3

This candidate gained full marks, Level 3, 6 marks. They have correctly explained that the bright colours are still present to attract peahens for mating. They then provide a detailed explanation at the genetic level of how the features evolved by natural selection, by explaining that the gene for bright colours is being passed on to the offspring, eventually outnumbering those without bright colours.

Question 9 (a)

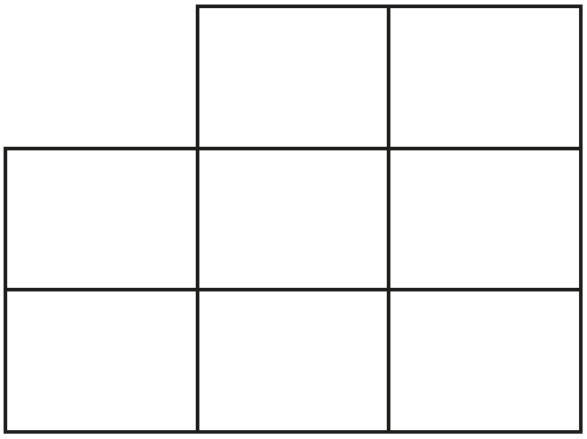
9 Read the newspaper headline.

First girl born into a family for 101 years

Having only males born into a family for this length of time is very unusual.

(a) Use your knowledge of how human sex is determined to explain why having only males is very unusual.

Use the Punnett square in your answer.



.....

.....

.....

.....

.....

.....

..... **[5]**

This question required knowledge on the inheritance of sex and how to use a Punnett square. Candidates were able to use the correct letters, identify females at XX and males as XY and give the correct ratio. Some candidates incorrectly used letters such and M and F for male and female or letters for alleles e.g. B and b. Despite an incorrect Punnett square many candidates gained credit for the ratio mark.

Question 9 (b)

(b) Gametes are made by cell division.

A fertilised egg divides to make body cells using a different type of cell division.

Complete the table describing the two types of cell division.

Type of cell division		
Type of cells made	gametes	body cells
Number of cells at the start of the process	1	1
Number of cells at the end of the process		
Number of rounds of cell division		
Number of chromosomes in the cell at the start of interphase	46	46
Number of chromosomes in each cell at the end of the process		

[5]

This question was very challenging for many candidates due to a lack of knowledge of mitosis and meiosis. Many rows were left blank or a variety of numbers were placed in the boxes such as 1, 2, 4, 16 and 23.

Question 10 (a) (i)

10 Scientists collected data on blood cholesterol levels and death from heart disease in men.

The graph in **Fig. 10.1** shows the relationship between blood cholesterol and the death rate from heart disease in the United States, Japan and two areas of Europe.

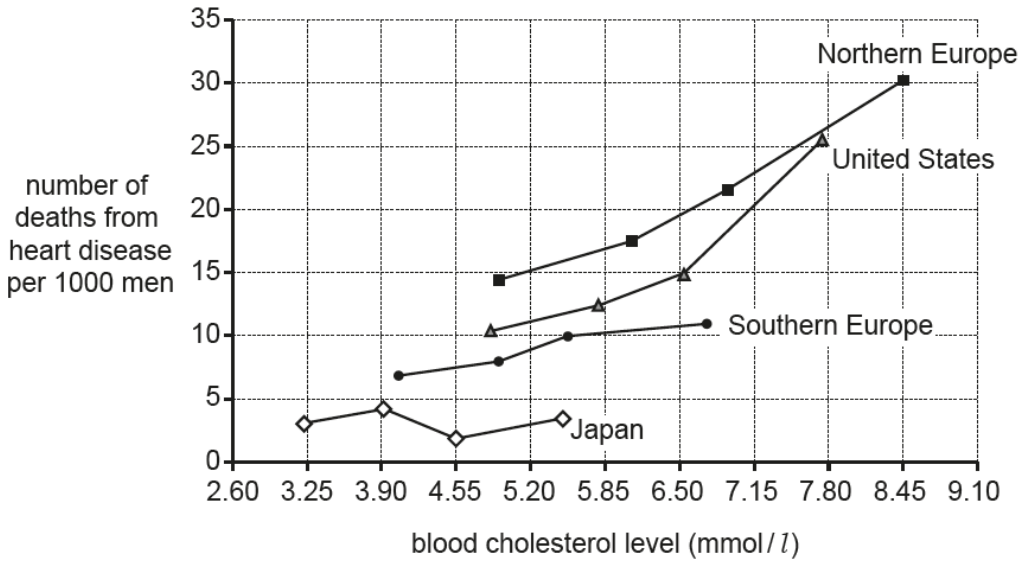


Fig. 10.1

(a) (i) Blood cholesterol levels are measured in millimoles per litre (mmol / l).

How many moles are there in a millimole?

Put a (ring) around the correct answer.

0.001 **0.01** **0.1** **10** **100** **1000**

[1]

The majority of candidates did not know that there were 0.001 moles in a millimole with a variety of the other available answers circled.

Question 10 (a) (ii)

(ii) A student reads off the graph and concludes that the death rate for men with a blood cholesterol level of 5.20 mmol / l is 15 deaths from heart disease per 1000 men.

Is the student's conclusion correct?

Use data from the graph in **Fig. 10.1** to explain your answer.

.....

.....

.....

.....

..... **[3]**

This question required the candidates to read the data from the graph and establish that the conclusion was incorrect for all countries except Northern Europe. Some candidates gained the first marking by recognising that Northern Europe did fit the data. When more correct data was given it was usually for Japan. Many lower ability candidates did not provide any data in their responses and some did not attempt this question.

Question 10 (b) (i)

(b) (i) A man in the United States has a blood cholesterol level of 6.50 mmol / *l*.

The graph in **Fig. 10.1** shows that 15 out of every 1000 men with this blood cholesterol level will die from heart disease.

Calculate the probability that he will die from heart disease.

Give your answer to **1** significant figure.

Probability = ... **[2]**

0.15 was a common incorrect answer as many candidates multiplied their answer by 100 as if calculating a percentage instead of a probability. Some candidates did not give their answer to 1 significant figure leaving 0.015 as their answer and so were credited only one mark.

Question 10 (b) (ii)

(ii) In a sample of 1000 men from the United States, 20 died from heart disease.

Use the graph in **Fig. 10.1** to estimate the mean blood cholesterol level of these men.

Blood cholesterol level = ...mmol / *l* **[1]**

This question required the candidate to read data off the graph. 6.50 was commonly incorrectly read for Northern Europe instead of the United States as stated in the question.

Question 10 (c)

(c) The scientists could collect other information to help explain the data on the graph.

One example of other information they could collect is the ages of the men in the study.

Suggest **other** examples of information they could collect to help explain the data.

.....

.....

.....

..... **[2]**

Many candidates were successfully able to analyse the information and provide ideas to develop the procedure. Many responses were credited for lifestyle ideas and weight. Pre-existing health conditions and genetic data were seen less often.

Supporting you

For further details of this qualification please visit the subject webpage.

Review of results

If any of your students' results are not as expected, you may wish to consider one of our review of results services. For full information about the options available visit the OCR website. If university places are at stake you may wish to consider priority service 2 reviews of marking which have an earlier deadline to ensure your reviews are processed in time for university applications.

activeresults

Active Results offers a unique perspective on results data and greater opportunities to understand students' performance.

It allows you to:

- Review reports on the **performance of individual candidates**, cohorts of students and whole centres
- **Analyse results** at question and/or topic level
- **Compare your centre** with OCR national averages or similar OCR centres.
- Identify areas of the curriculum where students excel or struggle and help **pinpoint strengths and weaknesses** of students and teaching departments.

http://www.ocr.org.uk/administration/support-and-tools/active-results/

CPD Hub
Your route to OCR's teacher training

Attend one of our popular CPD courses to hear exam feedback directly from a senior assessor or drop in to an online Q&A session.

https://www.cpdhub.ocr.org.uk

The small print

We'd like to know your view on the resources we produce. By clicking on the 'Like' or 'Dislike' button you can help us to ensure that our resources work for you. When the email template pops up please add additional comments if you wish and then just click 'Send'. Thank you.

Whether you already offer OCR qualifications, are new to OCR, or are considering switching from your current provider/awarding organisation, you can request more information by completing the Expression of Interest form which can be found here: www.ocr.org.uk/expression-of-interest

Looking for a resource?

There is now a quick and easy search tool to help find **free** resources for your qualification:

www.ocr.org.uk/i-want-to/find-resources/

www.ocr.org.uk

OCR Customer Contact Centre

General qualifications
Telephone 01223 553998
Facsimile 01223 552627
Email general.qualifications@ocr.org.uk

OCR is part of Cambridge Assessment, a department of the University of Cambridge. *For staff training purposes and as part of our quality assurance programme your call may be recorded or monitored.*

Cambridge Assessment

LLOYD'S REGISTER · LRQA
ISO 9001
UKAS MANAGEMENT SYSTEMS
001